EvoLogics GmbH develops underwater information and communication systems based on bionic concepts, combining cutting edge engineering with the best ideas found in nature. The advanced product features have become enabling technologies for deep water exploration and production.

EvoLogics range of products offers highly reliable, flexible and cost-effective solutions for multiple underwater communication, positioning, navigation and monitoring applications. We strive for innovation and invest our vast experience into developing, manufacturing and supporting products that deliver an excellent performance and solve the most challenging tasks.

The company was founded in 2000 in Berlin, Germany, by a group of leading international scientists and maritime engineering experts. The company since focuses on developing innovative solutions for maritime and offshore industries, as well as smart robotic systems design and bionic research.

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USBL POSITIONING AND COMMUNICATION SYSTEMS

APPLICATIONS

Positioning of offshore equipment
- Track the positions of offshore equipment during installation to ensure accurate placement at predetermined coordinates

Navigation of ROVs and AUVs
- Simultaneously track positions of multiple ROVs or AUVs and control their missions with instant commands

Cartography
- Locate underwater features with geo-referenced coordinates when used together with GPS or differential GPS
- Increase measurement accuracy

Diver Tracking
- Monitor positions of several divers and exchange information with them during the mission

SENSOR INTEGRATION

- ADCP: Acoustic Doppler Current Profiler
- SVP: Sound Velocity Profiler
- CTD: Conductivity, Temperature, Depth, Pressure sensors
- INS: Inertial Navigation System
- More options upon request

S2C R USBL Underwater Positioning and Communication Systems

EvoLogics S2CR USBL is a series of combined positioning and communication devices. Offering powerful USBL transceiver functionality with full benefits of an S2C technology communication link, S2CR USBL devices provide accurate USBL tracking and full-duplex digital communication, delivering an excellent all-round performance, ideal for application scenarios that demand space-, energy- and cost-saving solutions.

Switching between positioning and communication modes is not necessary: positioning data is calculated simultaneously with acoustic transmissions. Both features complement each other in a fully integrated positioning and communication system that opens new possibilities for a wide range of subsea applications.

- Full compatibility - use S2C R- and M-series modems as pingers or transponders
- Patented S2C (Sweep Spread Carrier) Technology - spread spectrum technology based on extensive bionic studies
- Simultaneous USBL positioning and data transmissions, track multiple targets simultaneously
- Can be used as Inverted USBL
- Self-adaptive algorithms for reliable performance in adverse underwater conditions, built-in forward error correction and data compression
- Advanced communication protocol with several data delivery algorithms: send and receive large volumes of data with the highest bitrate possible in current conditions; send and receive short instant messages without interrupting the main data flow between devices
- Addressing and networking: build relay chains and underwater networks with broadcasting capabilities
- Low power consumption and additional power-saving options

MODULES AND OPTIONS

- AHRS (Attitude and Heading Reference System)
- GPS integration
- Integrated rechargeable battery
- Acoustic Wake-Up module
- Integrated data-logger
- Acoustic releaser
- Short- mid- and long-range devices for shallow or deep water applications
- OEM versions available
- Compatible with S2C R modem and LBL solutions

PRODUCT INFORMATION GUIDE
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USBL POSITIONING AND COMMUNICATION SYSTEMS

APPLICATIONS

- Positioning of offshore equipment
  Track the positions of offshore equipment during installation to ensure accurate placement at predetermined coordinates

- Navigation of ROVs and AUVs
  Simultaneously track positions of multiple ROVs or AUVs and control their missions with instant commands

- Cartography
  Locate underwater features with georeferenced coordinates when used together with GPS or differential GPS

- Increase measurement accuracy
  Track the position of sensors and detectors to increase the accuracy of measurements

- Diver Tracking
  Monitor positions of several divers and exchange information with them during the mission

MODULES AND OPTIONS

- AHRS (Attitude and Heading Reference System)

- GPS integration

- Integrated rechargeable battery

- Acoustic Wake-Up module

- Integrated data-logger

- Acoustic releaser

- Short- mid- and long-range devices for shallow or deep water applications

- OEM versions available

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- CTD: Conductivity, Temperature, Depth, Pressure sensors

- INS: Inertial Navigation System

- More options upon request
EvoLogics SiNAPS, the SiNAPS, is installed on the Navigation computer. EvoLogics SiNAPS positioning software controls the positions. Optional third-party external instruments (an AHRS sensor and/or a GPS receiver) provide information about the vessel’s orientation and real-world coordinates. The customer’s Navigation computer is interfaced with the USBL transceiver and the external instruments and is connected to the local computer network.

Evologics SiNAPS is a client-server application. The SiNAPS server is a software component, installed on the Navigation computer interfaced with the USBL transceiver and other external instruments. The SiNAPS server receives, processes and stores data from the USBL transceiver and external instruments. It performs all the necessary calculations to display this information on-screen.

The SiNAPS client is the web-based user interface of the positioning system. It displays real-time information about the positions of the Vessel and the targets, provides access to data management tools and system configuration settings. The user interface can be opened in most current web-browsers on any device in the local computer network. It is possible to open SiNAPS clients on multiple devices at once. To access SiNAPS UI, one must simply navigate the web-browser to the correct address.

A USBL transceiver is mounted on a Vessel and uses acoustic signals to determine the distances and bearings to the tracking targets. The USBL transceiver measures the time from transmission of its acoustic interrogation signal until an acoustic reply from the Transponder is detected and converts it to distance to the Transponder. Containing several transducers separated by a short distance (the ultrashort baseline antenna), the transceiver calculates the angle to the Transponder using the phased-differencing method.

Transponders are attached to several tracking targets, for example, to autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), towfish etc. The Transponders reply to acoustic signals from the USBL transceiver with their own acoustic pulses, allowing it to calculate their positions. Optional third-party external instruments (an AHRS sensor and/or a GPS receiver) provide information about the vessel’s orientation and real-world coordinates. The customer’s Navigation computer is interfaced with the USBL transceiver and the external instruments and is connected to the local computer network.

Evologics positioning software, the SiNAPS, is installed on the Navigation computer. EvoLogics SiNAPS positioning software controls the positioning system and provides display features to monitor the mission in real-time.
A USBL transceiver is mounted on a Vessel and uses acoustic signals to determine the distances and bearings to the tracking targets. The USBL transceiver measures the time from transmission of its acoustic interrogation signal until an acoustic reply from the Transponder is detected and calculates the distance and bearing to the Transponder. The Transponders, which are typically mounted on vehicles such as ROVs, towfish, etc., reply to acoustic signals from the USBL transceiver with their own acoustic pulses, allowing it to calculate the distance and bearing to the vehicle.

Increased positioning accuracy when interfaced with an internal or external AHRS (Attitude and Heading Reference System) and an external GPS receiver.

EvoLogics SiNAPS is a client-server application that captures the positions of the Vessel and the targets, displays real-time information about the mission, and provides tools for data analysis and visualization.

The SiNAPS client is the web-based user interface, which can be opened in most web-browsers and simultaneously accessed by multiple devices at once. To access SiNAPS UI, one must navigate the web-browser to the correct address.

SiNAPS clients can be run on multiple devices at once. The user interface includes RTK correction services, AC-Bearing, and other features. It supports NMEA output, customizable data export, and connection to external AHRS (Attitude and Heading Reference System) for enhanced position accuracy.

**Specifications and Configuration Options**

<table>
<thead>
<tr>
<th>SD2R 4/18/34H</th>
<th>SD2R 4/2/24H</th>
<th>SD2R 4/24/7W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATING DEPTH</strong> (m)</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>OPERATING RANGE</strong></td>
<td>48-78 kHz</td>
<td>62-65 kHz</td>
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<tr>
<td><strong>FREQUENCY BAND</strong></td>
<td>1000 m</td>
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<tr>
<td><strong>TRANSDUCER BEAM PATTERN</strong></td>
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<td>horizontally omnidirectional</td>
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<td><strong>SIW4 SNR</strong></td>
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<td>up to 15.9 kHz/s</td>
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<td><strong>INTERNAL DATA BUFFER</strong></td>
<td>1 MB, configurable</td>
<td>1 MB, configurable</td>
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<tr>
<td><strong>INTERFACE</strong></td>
<td>Ethernet or RS-232</td>
<td>Ethernet or RS-232</td>
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<td><strong>POWER CONSUMPTION</strong></td>
<td>2.5 kV</td>
<td>2.5 kV</td>
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<tr>
<td><strong>INTEGRATION</strong></td>
<td>Waterproof, depthrating 2000 m</td>
<td>Waterproof, depthrating 2000 m</td>
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<tr>
<td><strong>DIMENSIONS (mm)</strong></td>
<td>Ø110 x 218</td>
<td>Ø110 x 218</td>
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<td><strong>WEIGHT (dry/wet)</strong></td>
<td>4000/500 g</td>
<td>4000/500 g</td>
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<td><strong>INTERNAL AHRS</strong></td>
<td>Xsens MTi AHRS</td>
<td>Xsens MTi AHRS</td>
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<td><strong>USB Interface Options</strong></td>
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<td><strong>POWER SUPPLIES</strong></td>
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<td>24 VDC (2 I/Os)</td>
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<td><strong>HOUSING OPTIONS</strong></td>
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<td>Delrin</td>
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<td><strong>FLEXIBILITY</strong></td>
<td>1) Radio==NFBH Radio==NFBH Radio==NFBH</td>
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<tr>
<td><strong>POWER SWITCH</strong></td>
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<td>not compatible with Ethernet</td>
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<tr>
<td><strong>ADVANCED TIMEKEEPING MODULE</strong></td>
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<td>1) Optional</td>
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<td><strong>SDM VERSION</strong></td>
<td>1) Optional</td>
<td>1) Optional</td>
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<tr>
<td><strong>ACOUSTIC RELEASE DEVICE</strong></td>
<td>1) Optional</td>
<td>1) Optional</td>
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<tr>
<td><strong>MOUSE AND OPTIONS</strong></td>
<td>1) Optional</td>
<td>1) Optional</td>
</tr>
<tr>
<td><strong>APPS</strong></td>
<td>1) Optional</td>
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</table>

**Specifications subject to change without notice. © EvoLogics GmbH | August 2018**
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